

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

03 SEP 27
September 21, 1983

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WBRD-50-390/83-18

WBRD-50-391/83-17

U.S. Nuclear Regulatory Commission

Region II

Attn: Mr. James P. O'Reilly, Regional Administrator

101 Marietta Street, NW, Suite 2900

Atlanta, Georgia 30303

Dear Mr. O'Reilly:

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2 - INACCURATE RESULTS FROM COMPUTER PROGRAM "ANCHORS" - WBRD-50-390/83-18, WBRD-50-391/83-17- SECOND INTERIM REPORT

The subject deficiency was initially reported to NRC-OIE Inspector L. Watson on March 29, 1983 in accordance with 10 CFR 50.55(e) as NCR GEN CEB 8302. Our first interim report was submitted on April 26, 1983. Enclosed is our second interim report. We expect to submit our next report on or about December 31, 1983.

If you have any questions, please get in touch with R. H. Shell at FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

DS Kanner

for L. M. Mills, Manager
Nuclear Licensing

Enclosure

cc: Mr. Richard C. DeYoung, Director (Enclosure)

Office of Inspection and Enforcement

U.S. Nuclear Regulatory Commission

Washington, D.C. 20555

Records Center (Enclosure)

Institute of Nuclear Power Operations

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ENCLOSURE

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2
INACCURATE RESULTS FROM COMPUTER PROGRAM "ANCHORS"
NCR GEN CEB 8302
WBRD-50-390/83-18, WBRD-391/83-17
10 CFR 50.55(e)
SECOND INTERIM REPORT

Description of Deficiency

Specific cases have been discovered which show that there are discrepancies in the input specifications for the direction cosines option of the ANCHOR computer program, and that the output has generally been misinterpreted in the incorrect coordinate system. These cases were discovered when the output could not be hand-verified.

The purpose of the ANCHOR load program is to combine the loads from both sides of an anchor, compare these loads to allowables, and provide total loads on the anchor. The loads on each side of the anchor are generally determined by a separate stress analysis computer program. If the loads on each side of the anchor are in different coordinate systems, the direction cosines option of the ANCHOR program must be employed to convert them to a common coordinate system. This system is referred to as the record coordinate system in ANCHOR.

Page III-4 of the ANCHOR program user's manual defines the direction cosines from the input system (the system used to define loads in the stress analysis program) to the record system. These input specifications are in error. To be correct, they should define the direction cosines from the record system to the input system. This difference can result in resultant loads being shown 90° in the wrong direction. Also, since the resultant loads are reported (output) in the record system and must be resolved into global and local loads by similar direction cosines, the anchor load designer could similarly misinterpret the results.

Interim Progress

TVA has identified approximately 400 anchors at Watts Bar which were analyzed using the direction cosines option of the ANCHORS program. These anchor problems are currently being reanalyzed using version 2.0 of the ANCHOR program which was issued on May 6, 1983. The resultant anchor loads are being compared to the previous design loads to identify anchors which will require redesign.

Version 2.0 of the ANCHOR program provides modifications which relieve the analyst of the task of computing global or local coordinate transformations by hand. The ANCHOR program users manual has been revised to reflect these changes. This should alleviate confusion regarding these conversions.